NASA Langley Flight Test Assets and Evaluation Capabilities

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Briefing Purpose

- To introduce the flight test assets and evaluation capabilities at NASA Langley
- Pursue areas of mutually beneficial working arrangements

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Simulation-to-Flight Research

Simulation

- Research Flight Deck
- Integration flight Deck
- System Integration Labs
- Cockpit Motion Facility
- Differential Maneuvering Simulator

Flight

- Aircraft
- Instrumentation development and integration
- Research system test and evaluation
- Flight Ops Support Center

Common:

- Researchers
- Hardware/Software
- Data Systems

Efficient, synergistic, & realistic aircraft safety and airspace research capability

Research

- Ideas
- Concepts
- Technology
- Constructs (Systems)

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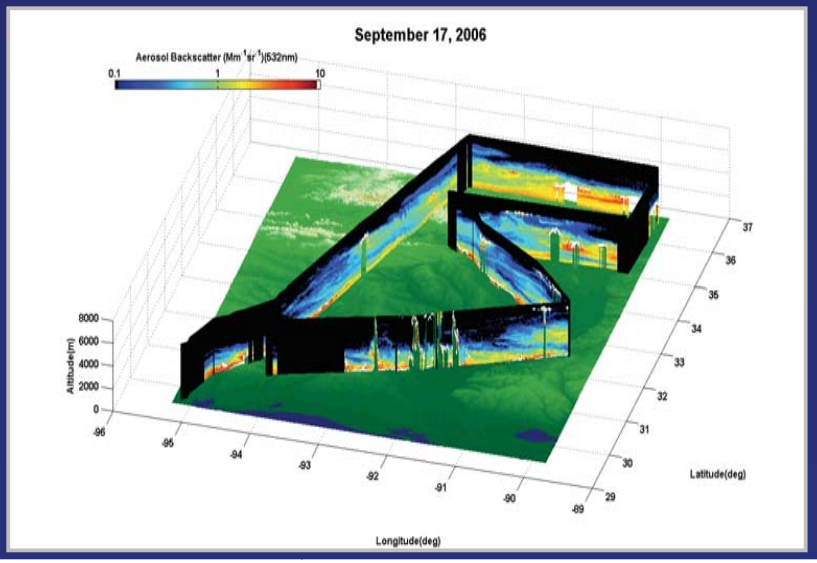
Science Platform - LaRC King Air B200

Altitude	35,000 ft (10.7 km), maximum 28,000 ft, nominal operating
Range	800 nmi (1,300 km) at sampling speed
Endurance	4+ hr, maximum (with IFR reserve)
Speed	259 KIAS (133 m/s) cruise

Payload	2500 lb (1,136 kg), maximum 500 lb (227 kg), with full fuel
Nadir port (2)	Fwd: 29.5 in. x 29.25 in. Aft: 26.75 in. x 22.5 in.
Electrical Power	(3)1400 W inverters, each supply 115 V AC, 10 A

Standard 19 in. rack, approx. 4 ft tall

4 down looking optical remote sensing instruments: width 19 in., length 30 in., and height 34 in.



Rockwell OV-10A Bronco

Main body of tank 61 in. long, 18-in. diameter

- Twin turboprop aircraft with tandem seating (non-pressurized)
- Fully aerobatic capable
- Reconfigurable aft cockpit for researcher/test subject with displays and controls
- Data acquisition system and telemetry available
- 75-cu.ft cargo bay
- Downward-looking capabilities with wing and centerline hard points for pods and equipment mounting

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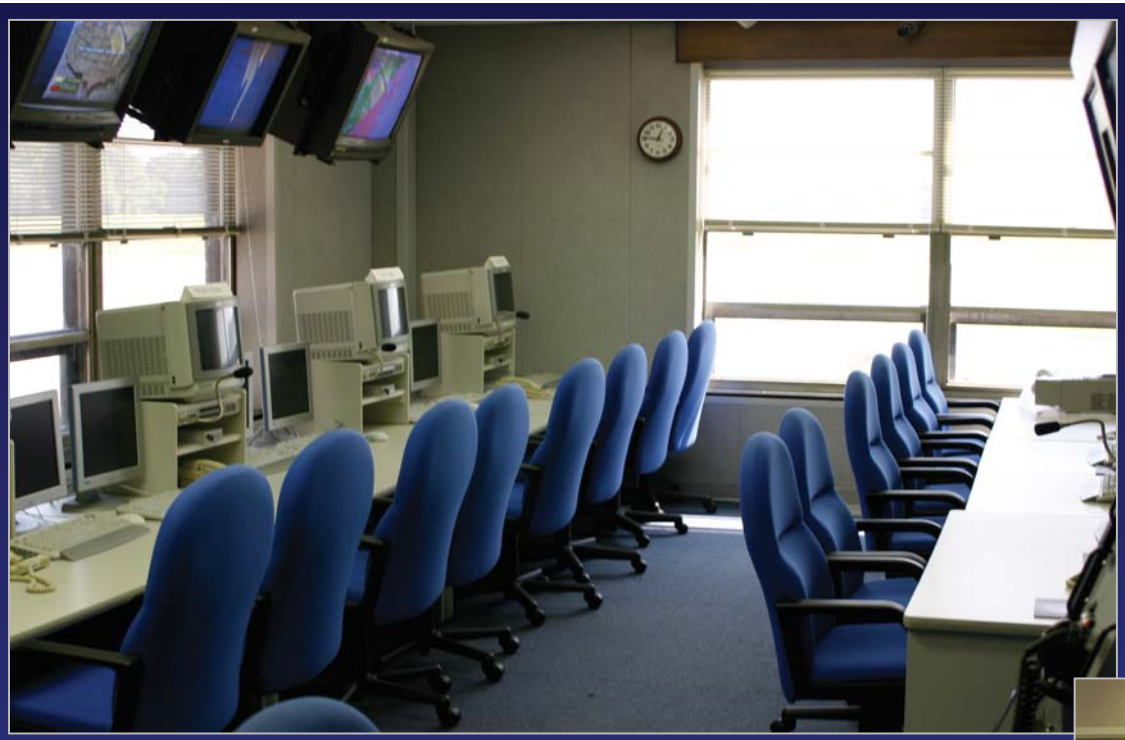
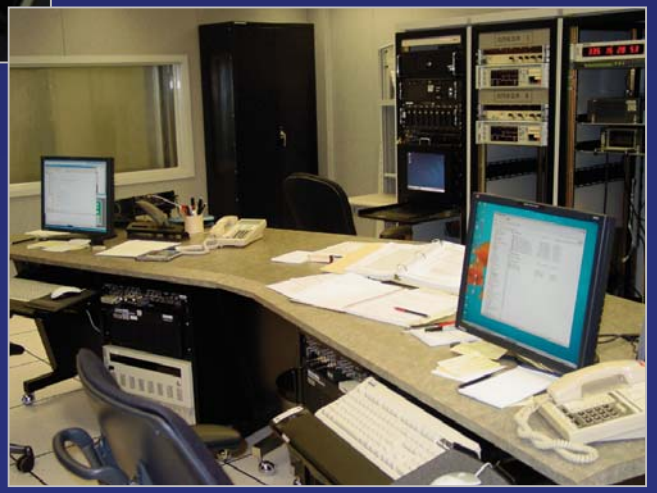
Flight Operations Support Center



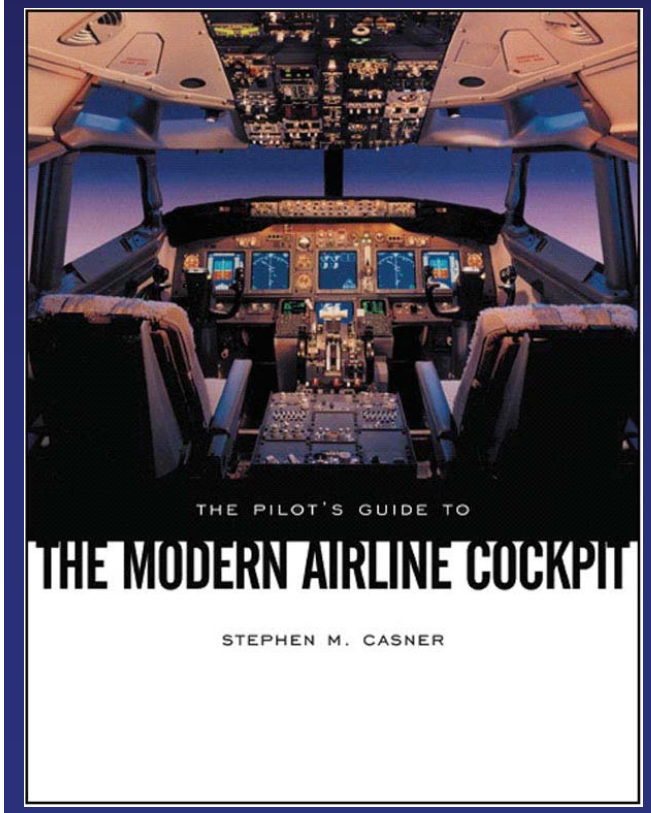
Flight Control Room



Data Acquisition and Processing Station

Coming Soon

- Unmanned Aerial Systems operations are a new frontier with much work to do
  - Procedures - airspace, air traffic control, safety
  - People - build acceptance, trust within all facets of aviation
  - Systems - detect-and-avoid, lost link, reliable on-board systems



- Developing new and unique Unmanned Aerial Vehicle (UAV) Test and Evaluation capability
  - A remote and autonomously controlled capability using a General Aviation aircraft
  - On-board safety pilot allows for easy access to the airspace system.

"Solutions must be thoroughly modeled/tested and reliably demonstrate Equivalent Level of Safety"

"One Stop Shop for Flight Test Research"

Unique Technical Expertise

- Electronic, hardware/structural, and software engineering for aircraft modification
- Mechanical and electromagnetic effects engineering, thermal analysis, and data acquisition
- Airworthiness engineers to certify modifications and conduct hazards analysis
- Maintenance and fabrication technicians
- Quality assurance specialists
- Flight crew and mission planning and operations

Flight Platforms (6)

Systems Integration Labs (2)

Fabrication Lab

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NASA-Langley Aircraft Parameters

Aircraft	Service Ceiling, ft	Normal Cruise Speed, knots	Duration, hr	Payload, lbs	Cost Per Flight Hour, $ (a)
B200	35,000	220	4	1000	1650
Cessna 206	15,700	142	6.7	1432	325
Cirrus SR22	17,500	180	6.1	1150	325
Lancair LC-40	14,000	200	5	279	325
OV-10A	26,000	180	3.5	4000 (b)	2000
UH-1H	14,000	110	1.6	1900	1650

Notes: (a) Includes flight planning, flight crew, and aircraft maintenance, does not include system integration;
(b) 3600 lbs can be external located in an external pod;

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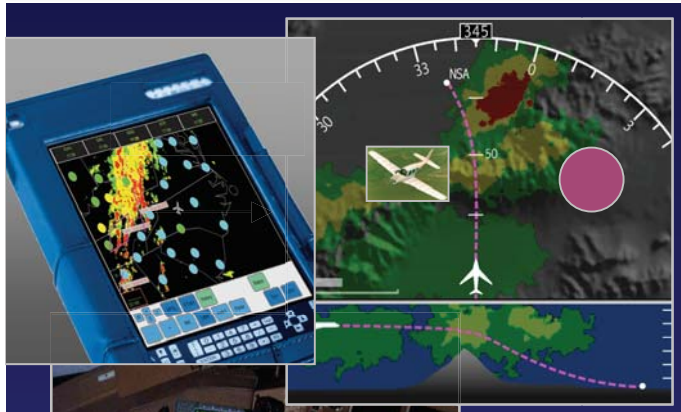
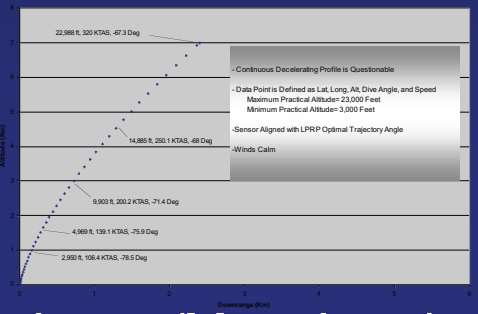
Flight Tested and Evaluated



Aviation "Weather Channel"

Audio Guidance

Atmospheric modeling and in-situ measurements



Lunar/Mars Lander radar systems

Synthetic Vision - Clear Skies All the Time

Attention Distribution Research

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Summary

- LaRC has uniquely skilled and experienced personnel to support R&D remote sensing flight validation and operation platform work
- Ability to meet research needs through dedicated resources
- Demonstrated efficiency and rapid response to meet customer needs
- Cost effective flight assets
- Proven domestic and international planning and operating capability
- NASA LaRC Science and Aeronautics personnel research facilities in close proximity

"One Stop Shop for Flight Test Research"

Contacts

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